Appendix A: Data Sources and Analysis Samples

Agricultural Resource Management Survey (ARMS)

USDA's Agricultural Resource Management Survey (ARMS) provides annual observations of field-level farm practices, the economics of the farm business, and the characteristics of the farm household for a nationally representative sample of all U.S. farms in the 48 contiguous States. The official USDA definition of a "farm" is any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the year.

The survey data support estimation of farm business income and performance measures, farm sector income and value-added, production costs for crop and livestock enterprises, farm practices used in the production of crop and livestock commodities, and household characteristics of the principal farm operator, including demographic and financial well-being measures. Continuous data series for household income and wealth measures exist from 1996, when the current format for data collection was introduced.

ARMS is a large multi-phase and multi-version survey, employing stratified sampling procedures suited to collecting the different kinds of information.[1] This analysis uses data from Phase III surveys, which collect information on farm income and expenditures, farm financial transactions, and the farm operator household during the winter months immediately following the reference year. Several versions of the Phase III survey are distributed. One enumerated version (version 1), employing personal interviews with trained enumerators, covers farms of all types, and contains more in-depth questions than in other versions—including the household questions on living expenses needed for this analysis. Survey weights are developed to generate nationally representative estimates from version 1 data alone. In addition, typically two to three other personally enumerated versions are designed to capture detailed characteristics of specific commodity enterprise types; survey weights are developed to generate nationally representative estimates from these versions for the enterprise types surveyed. Finally, a short "core" version, which is distributed and returned by mail, supports State-level estimates for the 15 States with the highest values of farm production. Another set of weights provides nationally representative data from the pooled sample across all five versions of the survey (the "full sample"). The systems of weights address sampling, nonresponse, and undercoverage (calibrating to independent USDA estimates).[2]

[1] The sample is screened for continued operation and commodity coverage in Phase I, conducted in the summer of the reference year. In the fall, randomly selected Phase I farms are surveyed in Phase II concerning their crop production practices and chemical use at the field or production unit level. During the following winter, selected Phase I farms are surveyed in Phase III concerning business finances and operator characteristics.

[2] For more information about the ARMS, see http://www.ers.usda.gov/Data/ARMS/.

Analysis Samples

Full family farm sample: To report household income and wealth measures, we use data from a pooled sample of all five questionnaires. Because we are interested in farm households, we restrict our analysis to "family farms," those in which the majority ownership of the farm business is held by the operator and relatives of the operator. Most farms (96 percent in 2006) are family farms. Most farms have only one operator. For multiple-operator farms, a principal operator is identified during the annual process of

collecting economic information from farm businesses.[3] The unit of observation, then, is the household of the principal operator.

Expenditure/consumption analysis sample: To analyze consumption and expenditures, we use a sample constructed from questionnaire version 1, the only version in which detailed household expenditure data are elicited. Currently, USDA does not impute values of the living expense component variables. The set of variables is subject to substantial nonreporting, resulting in a net loss of 28 percent of the farm population. We also select for study two subgroups within the farm household population: farm operator households of farms with sales of $100,000 or more ("large") and farm operator households of very small rural-residence farms (those where the principal operator indicates an occupation other than farming as his primary occupation, and whose farm has annual sales of $10,000 or less).

To assess the implications of using the smaller version 1 sample with attrition due to missing data, we report in Appendix table A1 descriptive statistics for key demographic and economic variables for the expenditure/consumption analysis sample (N=4,683), the full version 1 sample (N=6,457), and the full sample across the five versions of the survey (N=20,342). We find that the values in the analysis sample generally were very similar to the larger samples. Among the demographic variables, the analysis-sample values of all variables—including operator age, household composition by age category, and education—were within +/- 5 percent of the full-sample values.

Among the variables characterizing the distributions of farm household income and wealth, the only variable that was substantially different was median debt level. Since, on average, debt is a small fraction of assets, the difference is not reflected in net wealth.

Current Population Survey, Annual Social and Economic Supplement

The Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS) is designed to provide timely and detailed estimates of income, poverty and health insurance coverage, and to measure change in those estimates at the national level. Conducted by the Bureau of the Census for the Bureau of Labor Statistics, the CPS ASEC is the official source of the national poverty estimates calculated in accordance with the Office of Management and Budget's Statistical Policy Directive 14. (Though the Census Bureau also reports income and poverty estimates based on the American Community Survey, part of the 2010 Decennial Census Program, it recommends people use ASEC/CPS for national estimates because it provides more complete and thorough estimates of income and poverty.)

The sample is scientifically selected to represent the civilian noninstitutional population living in the U.S. The unit of observation is the household. About 70,000 households are interviewed each year.

Analysis sample: Because CPS collects data for a larger sample relative to CE, we use CPS to calculate estimates of well-being measures based on household money income for all U.S. households (tables 1 and 2). We also use it to benchmark the CE data, including the estimates of household

[3] About 40 percent of farms have more than one operator; however, for three-quarters of the farms with multiple operators, the farm is operated by a husband-wife team, so that both operators are part of the principal operator household on which we focus. About 10 percent of family farms have other operator households associated with the farm, for which no data are collected.

Appendix table A1

Comparison of ARMS analysis sample to ARMS total version 1 and ARMS versions 1-5 samples, 2006

Farm operator households	1	2	3
	Analysis sample	Full sample (version 1)	Full sample (versions 1-5)
		Percent	
Number of farm households	1,463,313	2,022,535	2,022,501
Sample size	4,683	6,457	20,342
Demographics			
Age of operator	57	57	57
Average number in household - all ages	2.7	2.7	2.7
Children under 18	0.6	0.6	na
Persons 65 and over	0.5	0.5	na
Education - highest degree of operator		*Percent*	
High school	62.3%	66.6%	64.8%
College and beyond	26.0%	25.0%	25.0%
Economics			
Household income		*Dollars*	
Mean	$75,080	$76,224	$77,654
Median	$55,330	$55,696	$56,022
		Percent	
Wage/salary income share	53.6	50.5	49.8
Self-employment income share	22.5	24.8	25.4
		Dollars	
10th percentile	$10,735	$10,151	$9,859
20th percentile	$22,871	$23,310	$22,400
40th percentile	$45,064	$45,930	$45,064
60th percentile	$67,662	$67,370	$67,801
80th percentile	$102,710	$104,349	$108,713
90th percentile	$143,392	$144,565	$167,570
		Ratio	
80:20	4.5	4.5	4.9
90:10	13.4	14.2	17.0
		Index	
Gini coefficient	0.556	0.568	0.576
		Percent	
Negative household income	5.7	5.9	5.9
Poverty rate per person	13.8	13.5	14.4
Poverty rate per household	12.5	13.0	12.5
Household net worth			
		Dollars	
Net worth, median	$578,650	$587,111	$554,549
Assets, median	$629,900	$656,375	$602,750
Debt, median	$12,750	$23,400	$23,400
		Index	
Gini coefficient	0.511	0.515	0.529

Continued—

Appendix table A1
Comparison of ARMS analysis sample to ARMS total version 1 and ARMS versions 1-5 samples, 2006—continued

Farm operator households	1	2	3
	Analysis sample	Full sample (version 1)	Full sample (versions 1-5)
	Dollars		
Household-owned autos			
Mean value	$24,542	$25,455	na
Household dwelling			
Mean value, owned by farm	$138,089	$143,052	$142,951
Mean value, owned by household	$192,914	$192,539	na
	Percent		
Share owned by farm	77.1	80.1	73.2
Share owned by household	20.4	18.0	26.8*
Share rented	2.4	1.9	

Notes. 'na' means not available in survey versions other than version 1. * includes rental share as well.

Sources: USDA, Economic Research Service using Agricultural Resource Management Survey, 2006.

income. For a comparison of descriptive statistics for the two samples, refer to the section on CE below.

Survey of Consumer Finance (Federal Reserve Board)

The Survey of Consumer Finance (SCF), a triennial survey published since 1989, is the major source of wealth estimates for the U.S. population.

The SCF unit of analysis differs somewhat from that in ARMS, CPS, and CE. Most of the data in the survey are intended to represent the financial characteristics of a subset of the household unit referred to as the "primary economic unit" (PEU). In brief, the PEU consists of an economically dominant single individual or couple (married or living as partners) in a household and all other individuals in the household who are financially interdependent with that individual or couple. Typically, around 4,500 economic units are interviewed for the main portion of the survey.

Analysis sample: This survey is the source of data for household wealth distributions for all U.S. households in table 2.

Consumer Expenditure Survey

The Consumer Expenditure Survey (CE) is a nationally representative sample conducted by the Bureau of Labor Statistics, designed to provide a continuous summary of the spending habits of U.S. households. Expenditure data are reported at the level of the consumer unit, which is defined as either a group of individuals who are related by blood or marriage, a single or financially independent individual, or two or more persons who share resources. Interview data are collected from consumer units five times over a 13-month period, every 3 months over five calendar quarters. In the first interview, data on demographic characteristics for each member of the consumer unit age 14 and over and an inventory of major durable goods of the consumer unit are collected. In interviews 2-5, expenditure data for the consumer unit for the prior quarter are collected. Employment and income information are collected in interview 2

Appendix table A2

Comparison of characteristics for CE and CPS, 2006

	CE: all U.S. consumer units	CPS: all U.S. households
Number of households (1,000)	118,843	113,687
Sample size		73,629
Demographics		
Age of reference person	49	49
Average number of persons in consumer unit:		
Total	2.5	2.5
Children under 18	0.6	0.7
Persons 65 and over	0.3	0.3
	Percent	
Black: *	12	12
Hispanic or Latino origin: *	11	11
Education:*		
Highest level attained was:		
Less than high school degree	13.0	14.4
High school	21.2	30.2
HS degree and some college	30.6	27.4
College grad and beyond	35.1	28.0
Economics:		
Household income	*Dollars*	
Mean	$60,533	$66,575
Median	$44,616	$48,054
	Percent	
Self-employment income share	6.0	5.3
	Dollars	
10th percentile	$10,594	$12,000
20th percentile	$18,333	$20,037
40th percentile	$35,044	$37,888
60th percentile	$56,153	$60,022
80th percentile	$88,687	$97,462
90th percentile	$122,707	$133,799
	Ratio	
80:20	4.84	4.86
90:10	11.58	11.15

*Asked of reference person in CE, CPS.

Source: USDA, ERS using Current Expenditure Survey, 2006, and Current Population Survey ASEC, Feb.-April 2007 (for 2006 data).

(which is carried over to interviews 3 and 4) and interview 5. (CE also includes a separate diary survey providing more detailed information on smaller or more frequent expenditures that are more difficult to recall.) In total, around 7,100 households participated each quarter in 2006.

Expenditures consist of the transaction costs, including excise and sales taxes, of goods and services acquired during the interview or recordkeeping period. Expenditure estimates include expenditures for gifts, but exclude purchases or portions of purchases directly assignable to business purposes. Also excluded

are periodic credit or installment payments on goods or services already acquired; however, interest applied to these balances is included in expenditures. The full cost of each purchase is recorded, even though full payment may not have been made at the date of purchase. CE elicits consumer-unit totals for multiple categories of income, using an open-ended format. If respondents indicate they do not know the exact amount, they are asked a followup question by a value-code elicitation format (the top code is $50,000 and up).

Many articles have documented measurement error in the income measure reported in CE, which results in substantial underestimates of income, on average. More recently, the Consumer Expenditure Survey has implemented multiple imputation of income data, starting with the publication of the 2004 tables. In multiple imputation, several estimates are made for the same consumer unit, and the average of these estimates is published.

***All U.S. household analysis sample**:* We use the individual interview data from the CE survey to report household expenditures and consumption measures for all U.S. households, and for comparisons of consumption and income within individual households.

To benchmark the CE sample, we compare CE and CPS estimates of key variables in Appendix table A2. In particular, we are interested in the comparison of the income distribution. We observe in Appendix table A2 that the demographic and family composition characteristics have similar values in the CPS and CE samples. However, at each of the decile cutpoints, the values of income are underestimated between 6 and 12 percent, with the greatest underestimate occurring at the 10th percentile.